Next Generation  *Natural Gas (NG)^2*

Information Requirements Report

The Energy Information Administration (EIA) has initiated the *Next Generation * Natural Gas* (NG)^2 project to design and implement a new and comprehensive information program for natural gas to meet customer requirements in the post-2000 time frame. This effort is in response to regulatory changes and the evolving structure and operations of the industry that have impacted the needs of EIA's customers for its data and other information products. Information users and providers are invited to comment on the proposed data requirements. EIA plans to consider these comments during the process of validating and refining a final set of data requirements.

EIA has undertaken this effort so that its natural gas data and analysis programs will reflect the information appropriate to a restructured industry. The (NG)^2 project uses input from public policy makers and other natural gas information users to identify and define the information needed for policy making, and to assess the gas industry's performance. This assessment includes addressing supply, demand and price developments within the industry; the competitiveness of the industry; and determinants of long-term demand.

This report is the initial effort of the (NG)^2 project and presents a draft set of data requirements that have been identified for the new information program.

- The first section of the report discusses the economic issues and public policy questions that the natural gas information program intends to address.
- The second section presents a brief background description of EIA's current data collection program.
- The third section describes how these requirements can be used to assess the performance of the industry and what issues are associated with the requirements.
- The fourth section is a table detailing the proposed data requirements.

After the final data requirements are established, EIA plans on implementing new and revised data collection and information programs. The plan for the implementation process includes innovative design and collection techniques and thorough testing of proposed collections. Collection of information by survey forms is only one option that will be investigated to address any new data requirements. In every stage of the (NG)^2 project, EIA plans to seek cooperation and feedback from natural gas information stakeholders. The (NG)^2 project is a long-term effort that has an ultimate completion date of January 1, 2003, with portions of the project becoming operational as soon as January 2001.

Public Policy and Economic Issues

The public's need for information about the natural gas industry has changed with restructuring. Public policy now relies on competition to ensure adequate supplies, low costs, and reasonable prices to consumers. Competition in exploration, development, and production appears to be vigorous. Storage facilities are multiplying and marketers are selling increasing volumes of gas. Residential and other small volume customers traditionally purchased gas solely from local distribution companies, but increasingly, these customers find they

have a choice of suppliers. At present, many still depend upon their local distribution companies to purchase their supplies, but the number of alternate arrangements is growing. Where customer choice prevails, the gas commodity is delivered by the still regulated pipelines and local distributors. Both the transition to a competitive market with continued deliveries by monopoly common carriers, and the perpetuation of utility companies as regulated merchants raise issues of public policy. Consequently there is a need to confirm that market mechanisms are working as intended. Public policy makers are also looking to natural gas to supply new competitive electricity generators and, longer term, to displace more carbon intensive fuels. Data are needed to make realistic assessments of the ability of the gas industry to support these policy objectives.

Deregulation has greatly complicated the task of collecting price data about the industry. Before deregulation, companies reported extensive financial information to regulators who verified that the costs and profits satisfied regulatory guidelines. Because pipelines and local distribution companies owned the gas in their custody they knew the purchase and sales prices. In that environment EIA only had to survey a small number of firms to obtain a complete picture of physical flows, financial returns, and prices in the industry. Today, pipelines and increasing numbers of distribution companies are becoming open-access transporters of natural gas. Because gas shipped along an open-access transporter generally is priced in unreported private deals, the transporter is not expected to reliably know the prices of the gas transported for others. In addition, entities which did not exist a decade ago (i.e., marketers, independent storage facilities, spot markets, and futures markets) are now central to the industry operation. The data collected under EIA's traditional approach has come to describe only a portion of the industry and fragments price, quantity, and financial data.

Some general public policy questions that require answers include:

- Is the industry functioning well? Do standard metrics show that gas is being supplied safely and reliably where and when it is needed at reasonable prices?
- Is the industry competitive? Has competition been sufficient to promote low prices, reliable service and improved efficiency? Do price differentials across customer classes accurately reflect differences in the marginal costs of serving them?
- What are the determinants of long-term demand, qualitatively and quantitatively? How much could long-term demand change in response to policies to reduce CO_2 emissions?
- What is the expected responsiveness of long-term supply of delivered gas to long-term demand? Can the increased demands for natural gas induced by CO_2 emissions reductions policies be met? Will there be sufficient pipeline capacity? At what price? What investments would be required?

Summary of Objectives

The *Next Generation * Natural Gas* project is an ambitious, multi-year effort that is intended to produce a revised data system for the collection and processing of a comprehensive information system to describe the natural gas industry and markets. The data system needs to reflect the new realities that have been caused or inspired by regulatory reform. Achieving a successful new program will support EIA's goal to serve policymakers and private decisionmakers with high quality, timely, and comprehensive energy information.

A number of features of the data redesign effort have been identified, including:

- EIA has long maintained quality coverage of volumes of gas delivered to consumers. It is expected that this quality and coverage can be maintained under the new information program.
- The usefulness of consumer sector definitions must be reconsidered. Would categorizations such as large versus small consumer or residential versus nonresidential consumer be more useful?
- The electricity generation sector is a key element in present markets and the

future energy outlook for the United States. Coverage of this sector at a detailed level of reporting is important to any effective data system.

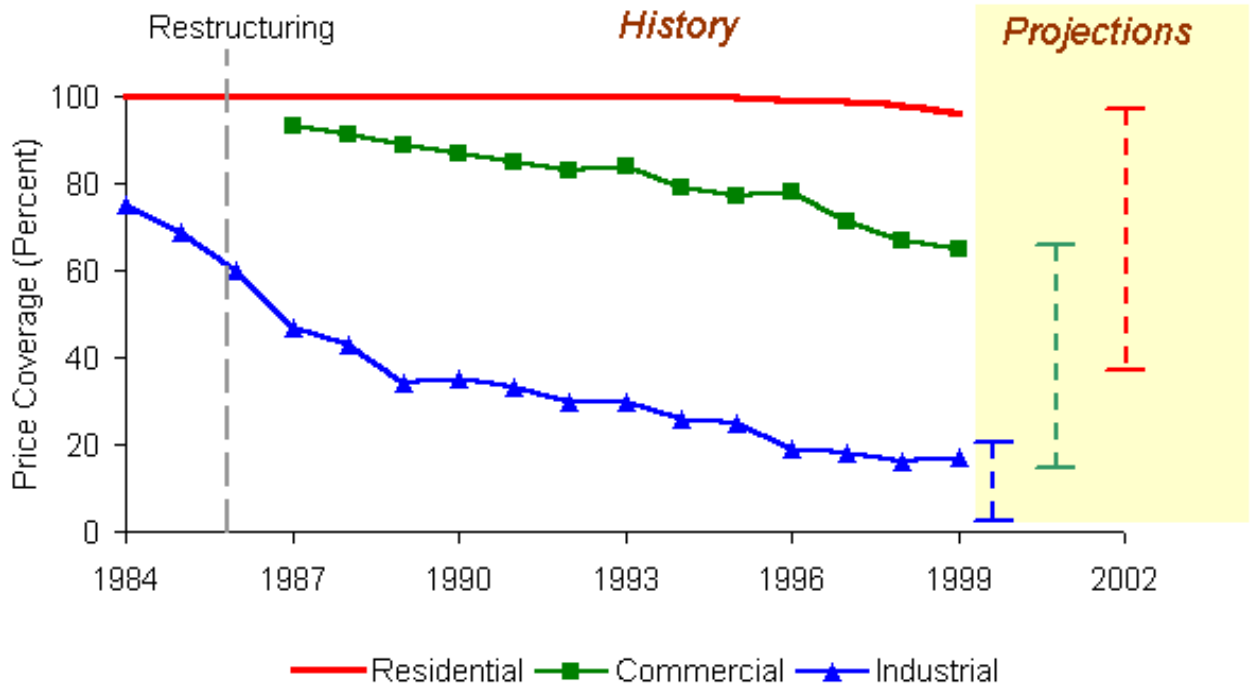
- EIA's coverage of prices has declined as the industry has restructured. It is expected that EIA can improve its coverage of prices with the new information program.
- Because consumer price information can no longer be gathered from a single source (primarily the local distribution companies), the price may be developed from several components and sources. The coverage and quality of data may be uneven among the various sources.
- The ability to understand the impact of new market institutions and their role in the efficient functioning of the marketplace is important and needs to be addressed in a comprehensive information program.

Current Data Collection Program

Most elements of EIA's current natural gas data collection program have been in place for more than 20 years. During this period as the industry has restructured, coverage of certain of its aspects has declined. It is expected that the current data collection program will be revised and expanded to address this coverage decline and to address new information requirements.

The most notable change in coverage has occurred as the physical and financial flows of gas in the market place have diverged. EIA's current data collections effectively track the volumes of gas flowing from processing plants and border points of entry through pipelines to storage and end-use customers. However, the coverage of prices has declined as marketers and other new players have entered the industry. The respondents that provide volume data to EIA often no longer know the associated prices. Price coverage has declined sharply in the industrial sector (by 80 percent) and significantly in the commercial sector (by 20 percent) (Figure 1). Coverage of residential prices could also decline soon as customer choice programs for purchasing natural gas are implemented in several States. For example, the State of Georgia has mandated retail supplier choice for many of the State's natural gas residential and commercial users. These developments are expected to impact EIA's coverage of these prices in Georgia.

Figure 1. Price coverage by sector has declined in recent years



Source: EIA, Office of Oil and Gas, Natural Gas Division

Data Requirements

The data requirements were developed from the results of a series of focus groups conducted by EIA with representatives of groups including the gas industry, state governments, economists, Federal officials, and others; the results of executive interviews conducted by EIA with industry representatives and Congressional staff; and meetings with EIA industry experts.[1] The data requirements were developed with careful consideration of the public policy and economic issues described above.

The data requirements are grouped into seven categories: domestic supplies, foreign trade, storage, consumption, transportation, distribution, and markets.[2] The discussion below describes how the requirements for these categories can be used to assess the performance of the industry and what issues are associated with the requirements. While the need for financial characteristics of companies and environmental data have been raised in discussions with users, the current effort is focusing more directly on market issues.

I. DOMESTIC SUPPLIES

Background and Purpose

Domestic supplies refers to the available gas supply originating in the United States. Components of domestic supply include gas volumes extracted from subsurface geologic formations (generally referred to as *production*); synthetic gas from coal, petroleum liquids, and biomass; gas produced as a byproduct of crude oil refining; and propane-air volumes introduced into the pipeline network or distribution system for peak supplies. Other than production volumes extracted from geologic formations, all other domestically produced supplies are

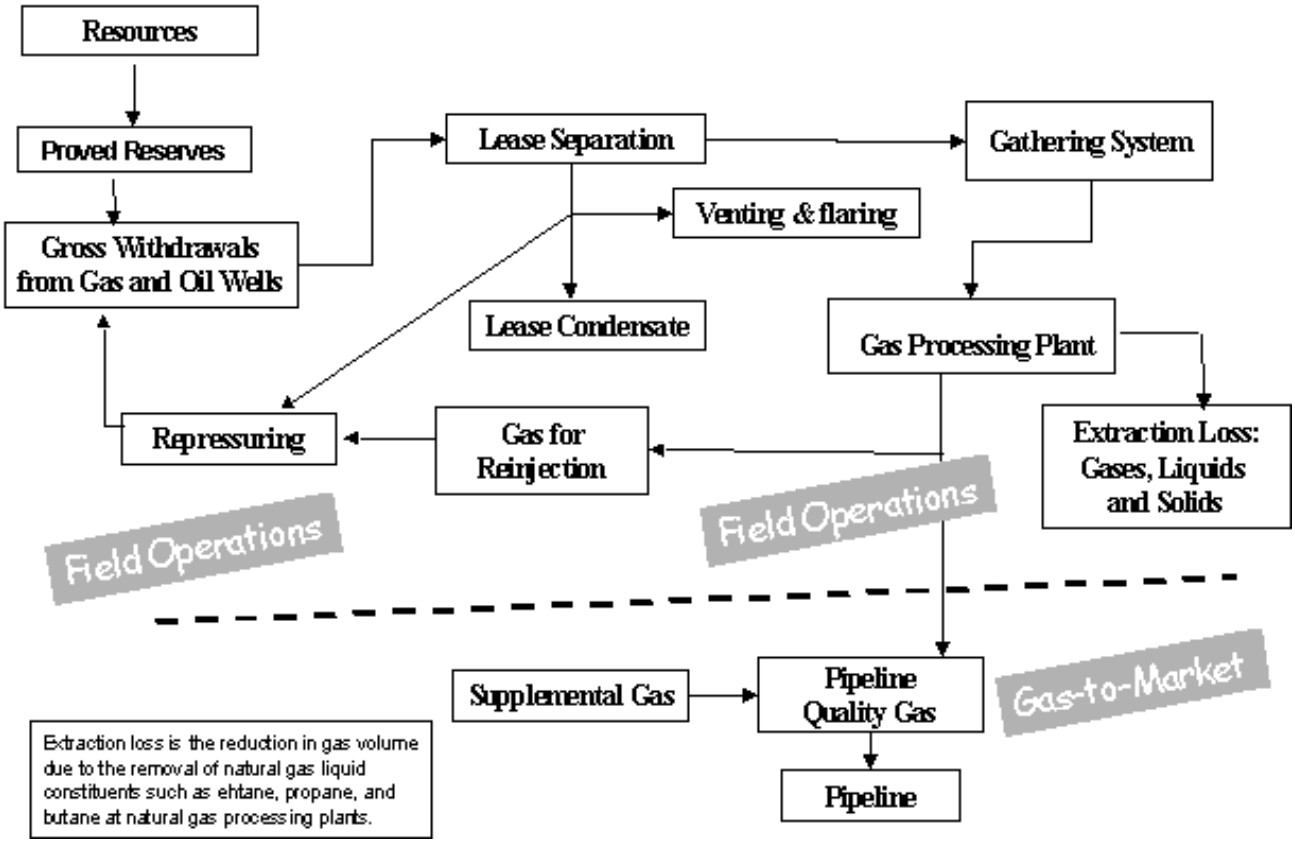
considered *supplemental gas*.

The largest portion of domestic supplies consists of produced gas from subsurface formations. A complete set of production-related information includes both market information, such as the net produced volumes and associated prices for transactions in upstream markets, as well as a host of other information not directly related to market transactions. This latter information includes a variety of generally technical factors such as resource and reserve volumes, lease condensate, reinjection activity, costs of operations, and productive capacity. These technical data may influence markets by affecting business planning and expectations, however they are not direct measures of market activity and are not presently being addressed in the *Next Generation * Natural Gas* project. The differentiation between "field operations" and "market-related activities" appears in the stylized schematic in Figure 2.

As the major segment of total market supplies, produced volumes are a key input affecting the market outcome, and they serve as an important measure of industry performance. Production data are important to complete the market balance picture on both a monthly and annual basis, and they are highly valued by EIA's customers.

A time-series of production data often is needed for various analysis applications. These data provide a basis for analysis of producer responses to economic incentives, which can serve as a key benchmark for policy formulation such as regulatory changes, or changes to effective tax provisions. Additionally, analysis of historical production data provides insight into the underlying natural gas resource base and potential future supplies under alternate conditions.

Figure 2. Schematic: Upstream Production Process



Source: EIA, Office of Oil and Gas, Natural Gas Division

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Data Items

Domestic supply data include volumes for all categories: production, synthetic natural gas (SNG, from conversion of petroleum liquids or coal), propane-air supplies, coke oven gas, refinery gas, biomass gas, and manufactured gas. All of this information is currently available on an annual basis, with production also reported on a monthly basis. In addition, prices for production and propane-air supplies are being considered for collection. Related information consists of the heat content of the fuel, which is the primary determinant of prices paid for gas in the market.

The plan calls for all supply and price data to be reported annually, while production prices and volumes are planned to be reported monthly. All data are expected to be available on a U.S. basis, as well as by State. A detailed listing of these data items appears in Appendix A.

Price/Cost Issues

Two major pricing issues are relevant to the domestic supply data: standardization of the point at which the data are measured and variation in energy content that may affect value.

Standardization of the reporting point for produced volumes. The wellhead price reported by EIA is actually a first-purchase price. That is, it is the average price for the initial transactions for gas produced and sold during the reporting period. The initial sale of produced gas can occur at a number of possible points in the supply chain: in the field (almost literally at the wellhead), after processing at a gas plant, or at virtually any intermediate point. The price for gas as a commodity reflects the cumulative cost of all activities or services incurred to the point of sale. The lack of a standard point for recording the first purchase means that at least some variation arises in price data due to the differing amounts of prior services or support activities that may be included (e.g., gathering, transportation, and processing).

Additionally, the nature of the gas product varies along the gas supply process chain. Gas going into a processing plant contains not only non-hydrocarbon products but also hydrocarbon liquids. Separation of the marketable gas from the hydrocarbon liquids and non-hydrocarbon products incurs a cost, which would detract from the value of the wet gas. However, the liquids and at least some of the non-hydrocarbon products have market value as co-products associated with the gas, adding to the value of wet gas. Non-hydrocarbon products without market value and a significant disposal cost simply lower the value of wet gas. Clearly the inclusion of this non-uniform product affects any measure of gas prices.

Heat Content. The energy within a standard physical unit of gas (e.g., thousand cubic feet) may vary by up to 5 percent or more, even for conventional natural gas that generally is considered to be homogeneous. The value of natural gas is in the energy provided, so proper measurement requires the heat content associated with a given physical volume in order to standardize prices.

One potential adjustment to the data as collected by EIA would be to have both volumes and prices reported on a Btu basis.[3] The heat content factor could be reported as a separate line item. The benefit from this adjustment is that the reported information would be on a basis consistent with that of most transactions. Additionally, the inclusion of a heat content factor would allow for conversion into physical units when necessary, such as for determination of pipeline capacity usage or requirements.

Other Issues

Natural gas production volumes and price information currently are collected by EIA from State agencies. Production data often are collected by a State agency that requires the information for another purpose-most often tax revenue collection and verification. Purposes other than reporting on production during a given period may result in data that meets the needs of the receiving agency instead of being a reliable measure of market-related activities. The data may not be timely or it may not be precise as a record of production or prices in a stated time period. In the case of a State tax agency that collects data to assess the collection of production-related taxes or fees during an entire year, consequences of systematic delays or interruptions in the data collection process might be important only as they impact revenue collection. A tax agency would need production-related information that is reliable over the fiscal year, but not necessarily accurate on a monthly

basis. Additionally, variation in collection procedures can itself impact the quality of the data. These factors can result in data collections that do not have optimal quality for statistical purposes.

II. FOREIGN TRADE

Background and Purpose

Natural gas imports contribute a significant portion to overall U.S. supplies of natural gas. Since 1994, net imports have represented 12 to 14 percent of U.S. consumption. The importance of foreign supplies to the U.S. energy future is expected to continue as the United States expands its consumption to levels exceeding 30 trillion cubic feet (Tcf). Nearly all imports (about 98 percent) enter the United States by pipeline from Canada. Generally, there is close to maximum utilization of pipeline capacity from Canada. Thus, the level of pipeline capacity and planned capacity additions at the United States/Canadian border is an indicator of possible growth in imports. Small amounts of gas are exported to Canada, Mexico, and Japan.

Gas imports and exports include shipments of liquefied natural gas (LNG). Liquefaction of natural gas makes overseas transportation possible. A 600-to-1 volume reduction is achieved by lowering the temperature of natural gas to approximately minus 260 degrees Fahrenheit. LNG is shipped primarily by tanker. (Recently, small amounts have been shipped by truck.) The United States exports liquefied natural gas (LNG) to Japan under long term agreements and imports it from a few countries, primarily Algeria, historically under long term agreements but with an increasing share bought as spot purchases. The presence of an active spot market is a substantial development in global LNG trade, since the future of LNG imports into the United States is expected to depend on competitive LNG import prices.

There are two LNG receiving terminals currently receiving imports in the United States: Lake Charles, Louisiana, and Everett, Massachusetts. LNG imports serve as supplemental gas supplies in the regional areas located near these facilities. A third receiving facility located at Elba Island, Georgia has not been in operation since 1980. In July 1999, plans were announced to reactivate this facility in 2002. A fourth facility at Cove Point, Maryland, is currently operating as a peak-service storage facility using domestic gas supplies received from the transportation network, although reopening for importation is being considered.

Foreign gas trade-related data are important for monitoring market performance and in consideration of public policy issues. Foreign trade has an important impact on U.S. markets and prices in general. Some regional U.S. markets, such as in the Northeast and Alaska, are greatly affected by either the availability of additional supplies or the presence of markets for disposition of surplus volumes. Volumes purchased from foreign suppliers measure the level of U.S. dependence on foreign supplies of gas. Analytical efforts may be needed to determine the security of foreign supplies.

Data Items

The data redesign plan calls for continuation of monthly reporting of import and export volume and price data by type of transport and country of origin or destination. Costs of LNG regasification are planned to be collected for transactions where the reported price is a landed price.[4] Existing pipeline capacity and measures of LNG facility capacity are expected to be reported as well as capacity for planned projects. Capacity data are expected to be reported annually. Heat content is a very important data item for foreign trade because it may vary as much as 10 percent depending on the source.

The data sources for volume and price information on imports and exports are currently the company filings made with the U.S. Department of Energy, Office of Fossil Energy. These filings report data on a monthly level and are received quarterly. The Office of Fossil Energy collects these data as part of its regulatory oversight responsibilities from companies authorized to import or export gas.

Alternate sources for information on pipeline imports and exports include government agencies, such as the National Energy Board of Canada, and Petroleos Mexicanos (Pemex), the national energy company of Mexico. LNG information can be compiled from a survey of individual companies. This approach is used, in fact, to produce preliminary monthly estimates for publication. A major advantage of using a single survey for all portions of the information is the improved ability to maintain consistency. Reliance on separate reporting

agencies exposes the resultant data to potential inconsistencies that are more readily discovered and addressed in a single systematic data collection process.

Price/Cost Issues

There are a number of issues that need to be addressed to provide useful reporting of prices: the point of measurement must be clear and uniform, preferably at the border. Prices need to be reported or converted in familiar units: U.S. dollars and English units (rather than metric units). Prices also need to be in consistent volumetric or heat units (e.g., multiples of Btu's). For LNG, it must be determined if the price will be provided as a landed price (approximately equivalent to border price) or tailgate price (includes regasification costs).

Other Issues

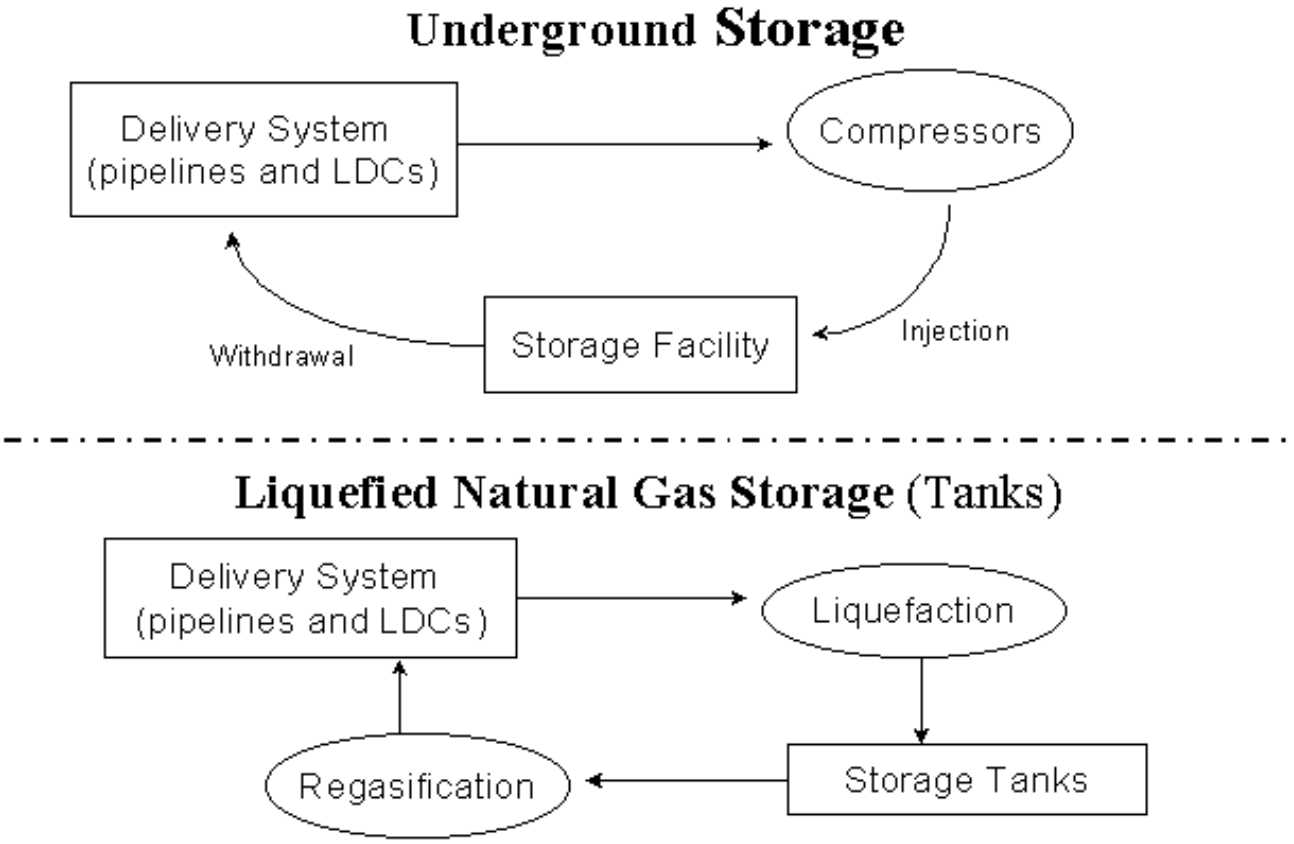
The data collected by the Office of Fossil Energy are reported on an equity (sales) basis. Other natural gas data represent physical movements of gas. These monthly data are reported quarterly so they lag the other natural gas monthly data. EIA has not regularly reported imports and exports categorized as short term or long term.

III. STORAGE

Background and Purpose

Storage operations differ from most industry activities in that it both removes gas from and supplies gas to the delivery system (Figure 3). In the restructured environment of the natural gas industry, storage plays a new and important role in natural gas markets. Previously, underground gas storage generally followed a simple pattern, in which it was withdrawn during the heating season (November through March) and injected during the refill season (April through October). While this is still the basic pattern, gas suppliers may vary their pattern of injections and withdrawals within seasons to take advantage of commercial opportunities. Stated another way, in the restructured industry operational decisions about storage utilization are being increasingly influenced by market factors rather than by seasonal factors. Additionally, costs associated with storage now have more interest because of the expanded strategic role for storage in the evolving gas industry. The EIA has not previously collected price information related to natural gas storage.

Figure 3. Schematic: Storage Operations - Underground Storage and LNG Operations



Source: EIA, Office of Oil and Gas, Natural Gas Division

There are three principal types of underground gas storage facilities: depleted fields (depleted reservoirs in oil and/or gas fields); aquifer reservoirs (water-only reservoirs conditioned to hold natural gas); and salt caverns (caverns hollowed out in salt "bed" or "dome" formations). A storage facility's daily deliverability or withdrawal capability is the amount of gas that can be withdrawn from it in a 24-hour period. Salt cavern facilities generally have high deliverability, so the working gas in a given facility can be withdrawn in a short period of time. By contrast, depleted field and aquifer reservoirs generally have lower relative drawdown rates, so they are operated to withdraw all working gas over the course of an entire heating season.

Gas can also be stored as liquefied natural gas (LNG), which reduces its volume. LNG storage facilities are usually associated with distribution companies. Because these facilities have a relatively high drawdown rate, LNG storage is especially suited for local distribution companies (LDC) to meet their delivery requirements, especially during times of peak demand.

Data Items

The total amount of gas in underground storage facilities consists of base gas plus working gas. Base gas is the volume of gas needed as a permanent inventory to maintain adequate underground storage reservoir pressures and deliverability rates throughout the withdrawal season. Working gas is the volume of gas in an underground storage reservoir above the designed level of the base. The plan calls for the continued collection of monthly volumes of base gas, working gas, injections, withdrawals, and peak day withdrawals from underground gas storage facilities. These same volume data would be collected for LNG facilities annually as they are in the current system, and a monthly reporting frequency is also under consideration. Monthly prices for underground

storage would also be collected. Data on heat content would be collected for all volumes.

Physical characteristics of storage facilities would be collected annually. For underground facilities they include: type of facility, capacity delivery system, number and size of pipelines serving the facility, the design withdrawal rate, number of active fields and field capacity, and planned projects. For LNG facilities they include capacity and maximum withdrawal rates. Annual financial data would be collected from underground and LNG facilities for operation and maintenance costs, capital, and taxes.

Price/Cost Issues

A key issue for the collection of natural gas storage costs is the appropriate measure for cost determination. The monetary terms of storage contracts include fees for injection and withdrawal activities, retention of gas in storage, and capacity reservation rights. The costs need to be collected in a way that is reasonable for the respondent and meaningful for the data customer. The cost concepts should be developed carefully to reflect industry activities or conditions, and avoid distortion. This aspect of the data system needs to incorporate industry perspectives on accounting for storage costs and how these costs motivate decisionmaking and behavior.

Other Issues

None at present.

IV. CONSUMPTION

Background and Purpose

Consumption data are demand-related information pertaining to the major consuming sectors. These data provide the basis for understanding the market for natural gas. Total gas consumption includes volumes used for producing and transporting natural gas, as well as the volumes consumed by endusers. However, gas consumed in production processes is included in the domestic supply data, and gas consumed in the operation of pipelines is included in the transportation data.

As one-half of the natural gas market, consumer behavior is a key factor that drives current market conditions. Consumption data are important to complete the market balance picture on both a monthly and annual basis, and they are highly valued by EIA's customers. These data provide a basis to analyze consumer responses to economic conditions, which can serve as a key benchmark for assessing the impact of regulatory changes or in developing additional policy formulation. As regulatory reform is introduced in various States, there is a pressing need for analysis to measure the impact on consumers and overall market performance. Additionally, analysis of historical consumption data provides insight into the underlying long-term consumer trends that affect energy markets today and the outlook for all energy markets in the future.

Data Items

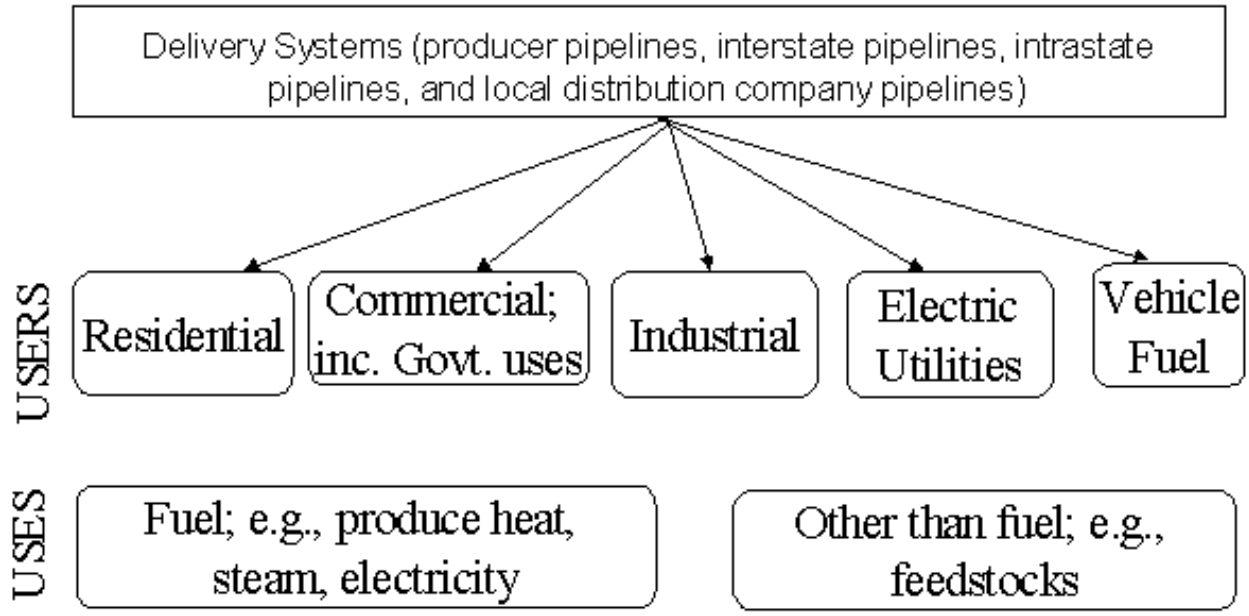
Volume and price data are planned to be reported for the five end-use sectors: residential, commercial, industrial, electric utility, and vehicle fuel (Figure 4). Prices may vary systematically due to seasonal charges or influences on costs. The appropriateness and availability of seasonal price data are planned for assessment. The planned collection includes fuel switching data for industrials and electric utilities, including capacity and type of fuel consumed, are planned to be collected. Specifics of the requirement to collect cogeneration data are being investigated. At cogeneration facilities, gas used in manufacturing processes also results in the production of electricity.

All end-use volume and price data are planned to be collected monthly, except for vehicle fuel data which is expected to be annual.[5] Numbers of consumers is expected to be reported annually. Fuel switching consumption is planned to be reported monthly while capacity is expected to be reported annually. Any cogeneration data is expected to be collected annually. All data are planned to be available on a National and State basis.

Price/Cost Issues

The major concern related to consumption data is the ability to collect accurate and reliable price data at reasonable cost. Coverage of price data has declined in EIA's current data collection program, due to the restructuring of the industry. Historically, EIA has compiled data on consumption volumes and prices by contacting suppliers that deliver gas to consumers. This system worked very well under regulation because the number of firms was limited, and both interstate pipeline companies and LDCs tended to be gas merchants. Due to the merchant role, these companies provided a comprehensive set of services that took ownership of the gas in one location and delivered it at a time and place to suit the customers. Thus, a relatively small number of firms[6] had direct knowledge of all gas consumption by endusers. Further, regular reporting of extensive commercial, operational, and other data was an accepted aspect of the monopoly franchise arrangement between the firm and the regulators.

Figure 4. Natural Gas Consumption by Sector



Source: EIA, Office of Oil and Gas, Natural Gas Division

The movement toward regulatory reform has altered the structure and operations of the former interstate pipelines, and it is increasingly changing the landscape for LDCs. Regulatory reform at the Federal and State levels generally involves the conversion of operations from a private merchant function to an open-access transporter. This has undermined the ability of the traditional data collection process to gather all the desired data. For reasons described in the following, coverage of industrial, and to a lesser extent commercial, prices has declined greatly. Programs at the State level, either now or in the future, may jeopardize volume data in addition to the price information.[7]

Firms in any industry tend to have detailed information only for their own operations. The shift to open-access operations removes from the transporter the complete knowledge of the costs and volumes delivered, as well as information on the customers themselves. At the Federal level, the conversion of the interstate pipelines provided opportunities for many large-volume gas consumers to search out lower-cost supplies that then could be transported to the consumption location. This was done whenever those consumers could achieve a lower total delivered cost than the prices that were offered by the merchant LDCs. The pipelines knew and reported on the volumes delivered to the mostly industrial customers, but regarding the price, they did not know costs beyond the transportation charges. As this practice spread, the coverage of price data declined to below 20 percent of volumes delivered to industrial users.

The LDCs presently deliver virtually all gas consumed by residential customers at present, and much of the gas

consumed by commercial and small industrial customers. As the States in which they operate initiate regulatory reform, the operations of LDCs change in ways that affect the data and the capability of the traditional data collection process. With unbundling, LDCs generally have retained only the delivery function, and the other activities such as meter reading and billing are performed by the sellers of the gas commodity or independent service companies.

Reforms in the industry have adversely impacted the capability of the traditional framework to collect accurate and reliable consumer information. EIA is investigating various options for gathering price and volume information for end-use consumption. Options for price data include contacting consumers directly or gathering the separate components of price from suppliers and constructing the delivered price. The most ready alternative for data collection relies on the operation of a single billing entity[8] that serves as a focal point of all recorded data (for billing purposes). If the data could be collected from the billing company, this would facilitate the process and undoubtedly enhance the results.

The particular provisions of reform programs vary significantly between States, so it is virtually certain that the final data collection system will not be able to rely on a single procedure. In fact, it is most likely that the system will require combinations of collection procedures for at least some States.

Other Issues

There are a number of additional issues including the end-use sector definitions. The standard EIA sectors for natural gas are residential, commercial, industrial, electricity generation, and vehicle fuel. The first four sectors are classifications originated under traditional regulation that served the purposes of policymakers. Over time, the distinctions between the sectors began to blur. Electricity has been generated by industrial firms as a by-product of their base operations. Commercial and industrial customers come in a wide range of "sizes," and the trend to complex corporate combinations obscures the distinctions even further. Additionally, as the role of traditional regulation gives way to reforms, the relevance of the standard customer classes may diminish correspondingly. In that case, the company record-keeping is not expected to continue to conform to these categories, unless it serves a commercial advantage. In the current restructured industry, classification by size (amount of gas consumed), at least for non-residential customers, may be more appropriate than the historical classifications of residential, commercial, industrial, electric utility, and vehicle fuel.

The data redesign work is investigating the possibility that company records may categorize commercial and industrial customers by volumes. One outcome is that customers may be classified as residential, small industrial/commercial customers, large industrial/commercial customers, and electricity generation. This is based on a reasonable presumption that public agencies maintain a continuing requirement that firms identify residential and electricity generation customers explicitly.

A related issue involves the data recorded for nonutility electricity generation (NUGS). NUGS have grown as a source of electric power, especially with the stimulus provided by public policy actions such as the Public Utilities Regulatory Policies Act of 1978 (PURPA). Being outside the class of firms recognized as electric power utilities, NUGS have been included as industrial users of gas. Regulatory reform in electricity generation has virtually eliminated the distinction between these types of power generation companies. The classification issues may be resolved without much debate, but this change has important implications for the collection of these data. Natural gas consumed by electric utilities previously has been reported as part of the collection of electric utility information, while NUGS information was collected as part of the natural gas data collection. The redesign of both systems requires coordination to avoid data gaps.

Lastly, it is noted that gas consumption volumes have been, and are expected to be, measured by sales information. This standard generally has worked well to this point because gas is taken off the system as it is used by the customers, and sales were recorded at or close to the burnertip. However, the development of imaginative selling arrangements, especially those involving third parties such as marketers, poses a potential threat to this convention. For example, large-volume consumers of energy may have a purchasing division or agent that tries to optimize gas acquisition strategies to balance the often-competing objectives of supply security and cost minimization. A large purchase may be transacted at one location, such as the Henry Hub, to

capture an attractive price. The sales record, however, likely would not show where and when the gas was actually consumed, which might be virtually anywhere in the Lower 48 states. Further, the purchase may be for volumes of gas to be delivered over an period of weeks or longer. Without metering close to the point of consumption, the ability of sales records to reliably reflect consumption may diminish over time.

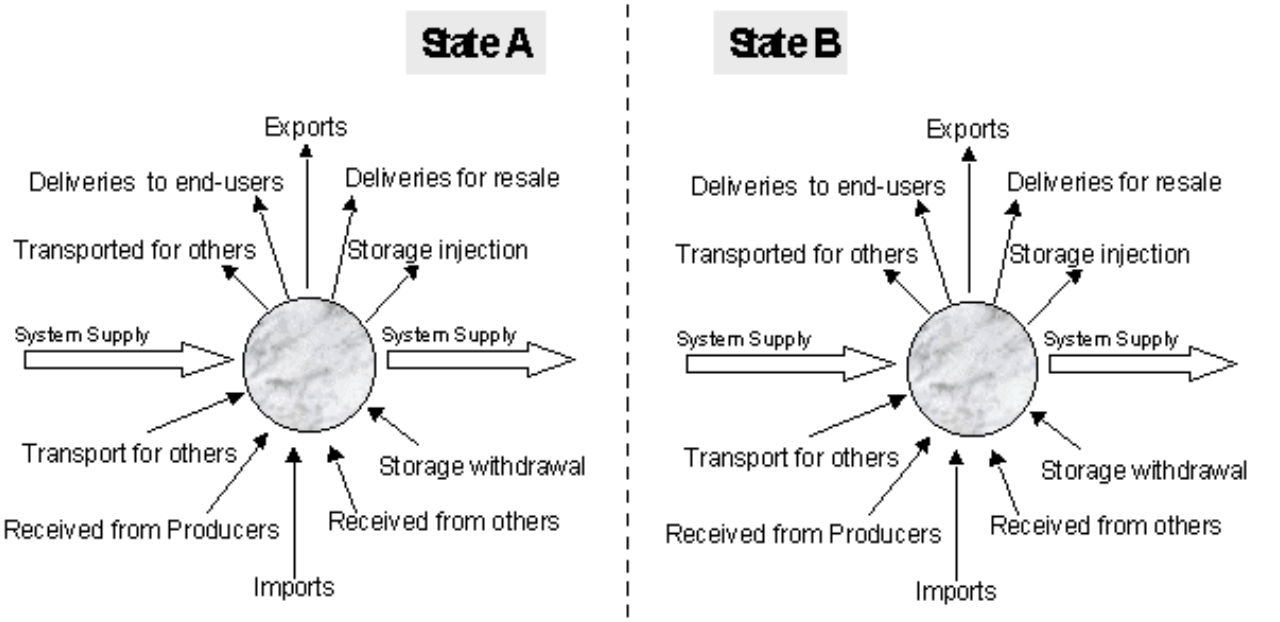
V. TRANSPORTATION

Background and Purpose

Transportation refers to the essential activity of moving gas from upstream sources, such as producers or importers, to downstream users. The transportation system in any given State or region may include numerous receipt and delivery points (Figure 5).

Information on natural gas transportation activities has grown in importance with restructuring of the natural gas industry. Under the traditional regulatory regime, pipelines operated as natural gas merchants. They took ownership of the gas as they bought and resold it to a variety of customers. A key attribute of this arrangement is that the purchaser from the pipeline received the commodity at an agreed point, and the set of services required to deliver each unit was combined into the commodity so that the individual services were not differentiable to the customer. In particular, this obscured the costs of each service required to deliver gas to the customer. While an essential aspect of the supply chain and an identifiable activity, transportation was only one task within the overall merchant function.

Figure 5. Schematic: Flows Within States and Between States



Notes:

Each activity represents physical flows. 'System supply' refers to pipeline or distribution company flows on its own system from/to another state or system. Local distribution is represented by a node in a single State. Where local distribution companies continue as merchants, "deliveries" represent sales, and "receipts" represent "purchases." For an interstate pipeline, it is a flow arc only; for an LDC, it also may represent a commercial transaction.

Source: EIA, Office of Oil and Gas, Natural Gas Division

As a result of regulatory reform at the Federal level,[9] pipelines are limited to providing most services on an

unbundled or stand-alone basis. The primary role of pipeline companies has changed from providing a firm supply of natural gas to providing regulated transportation and storage services to a wide range of customers. While supply and storage functions can be conducted by non-regulated affiliates of the pipeline company or its corporate parent, transactions between the regulated and non-regulated entities must be conducted at "arms-length." This division was perceived to be essential to promote and maintain competition in the industry.

The shift to open-access transporter altered the fundamental role of the pipeline companies in the supply process with significant implications for a comprehensive natural gas data system. The changes made transportation services a distinct operation in the gas industry, and so resulted in a much greater need for reporting on this essential segment of the supply chain. Further, the changes had two major impacts directly on industry data: first, the types of transportation services offered by pipeline companies has multiplied, and second, capacity rights may be bought and sold at market prices by shippers (marketers, endusers, local distribution companies, producers and other pipeline companies) on the pipeline systems. Information on these new aspects of the industry needs to be available and reported.

Data on transportation activities and related items are important to complete the picture of market performance on both a monthly and annual basis. As a key industry element that provides a "bridge" between buyers and sellers, transportation is fundamental to the marketplace. Efficient, competitive markets are not attainable without the necessary infrastructure. EIA's customers have expressed interest repeatedly in activity measures, such as flows and utilization rates, as well as in structural information regarding capacity and capacity expansions. EIA reports and analyses on gas transportation, deliverability, and capacity turnback or release are highly valued by our customers.

This portion of the natural gas data system would provide information for policymakers and analysts to examine current industry and market conditions and trends, as well as to conduct retrospective assessments of network performance in prior periods, with implications for the future. A primary concern for policymakers and private companies alike is the capability of the industry to meet these requirements. For example, Jay Hakes, at the invitation of the Federal Energy Regulatory Commission (FERC), provided testimony at a FERC public hearing on June 9, 1999 regarding future gas requirements in the Northeast. The EIA information was considered very important to their deliberations on the need for further capacity expansion. Such information also serves as a guideline in investment decisions for both supply and demand projects. Natural gas demand, especially electric power generation using natural gas, is expected to expand greatly through 2020. The long-term nature of major capital expenditures requires a reliable source for needed information.

Data Items

Transportation data may be classified into two major categories: physical and market activity information. Physical characteristics include design flow capacity, maximum capacity, measured peak volume flow or delivery, measured average daily flow (delivery), customer class and location utilization rates (load factor), and geographic location information. Market characteristics include the price of the primary capacity and price of secondary trading of the capacity, identification of capacity holders including customer class designation, contract information such as amount of capacity held, location of reserved capacity, and term or length of contract.

The plan calls for annual collections of all structural data, and monthly collection of volume-related activity, price/cost, and contractual data. Data should be available on a National and State basis, although the aggregation by location is not as straightforward as is the case for most industry and market data. Additional details for transportation corridors or marketing areas are expected to be provided as appropriate. A detailed listing of these data items appears in Appendix A.

Price/Cost Issues

There are two key issues concerning the collection of pricing data for transportation. First, the method of cost determination can impact the data and, perhaps even more importantly, mask the economic incentives faced by shippers. Secondly, rates differ due to a complex set of factors such as the distance transported and variations in level of service, as well as the tariff methodology.

The tariff methodology can alter the fundamental determination of prices in ways that affect the comparability of data. In simplest terms, tariffs generally consist of fixed and variable elements. As the proportion of costs allocated to each category shifts, it affects both the recorded transportation charges at that point and the economic incentives for use of that service. The allocation of costs can have a systematic impact on rates between seasons for a given contract. The larger the fixed cost component, the smaller (larger) is the total unit charge during peak (off-peak) seasons, since the average fixed cost per unit volume varies inversely with respect to volume, although comparison of the cost for entire years should avoid this seasonal affect.

The prices for transportation service can vary with the distance of the shipments,[10] cost of service (e.g., firm or interruptible, although actual degrees of "firm" or "interruptible" requirements can vary widely), or performance parameters that guide the degree of flexibility in execution of the arrangement. Examples of performance parameters include notification requirements, make-up provisions, and daily or longer volumetric provisions.[11]

The interest in additional detail ultimately is subject to the ability of respondent companies to provide these data, which generally depends on their record-keeping practices. Companies may have non-uniform practices to best meet their own needs for the information. A key task for the data redesign project is the investigation of company data and whether the respondents can reasonably meet the intended requirements of the proposed data system.

An additional concern in pricing is the variation in heat content, which would alter the unit charge per Btu transported. The system would require this information from transporters to normalize price and cost information on a uniform basis.

Other Issues

The data reporting point can raise difficulties for data collection. Transportation service extends from one location to another, transversing multiple intermediate locations. Some of the problems associated with averaging or aggregation can be mitigated in the collection process by the incorporation of additional detail. Extensive detail in presentation for publication may be either too costly or unwieldy to avoid all distortion. Secondly, much of EIA's data is collected on a confidential basis, which limits the degree of detail whenever the data are disseminated. Lastly, our customers frequently are interested in receiving only a few summary statistics rather than a massive data base with extensive detail.

The location of the service is a key issue in both the collection and presentation of transportation data. Transportation activities are conducted to move gas between particular points, so they transcend specific locations, unlike many, if not most, of the other gas industry activities that occur in a recognizable location: production flows from the well; sales occur at wellheads, hubs, city gates,[12] pipeline interconnects, storage facilities, and the burnertip; consumption is conducted where the consuming equipment is located.

Since a single transportation activity or asset generally involves multiple locations, the selection of a single point is not straightforward. Applications of the data, such as capacity utilization rates, can vary widely depending on the approach. For example, capacity utilization rates for a region such as the Northeast may yield a much different picture conditional on whether capacity entering or departing each State is used as the basis. Thus, the development of the congestion index will require further investigation to develop this concept as a practical reality and a useful analysis or decisionmaking tool.

Within a geographic boundary, the summation of pipelines of widely dissimilar lengths, capacity, and direction is problematic. In addition, flow activity and network structure are greatly interconnected among points and other features of the network. Aggregation of flow capacity in any area may be misleading if capacity up- or down-stream is insufficient to accommodate design flow in the area of interest.

Data may be aggregated by State, markets served, or corridors in which the flow occurred. The selection of each of these for reporting purposes is a convention that has different implications for the meaning and interpretation of the data. The aggregation of the data across companies, locations, or time will be carefully considered to avoid unnecessary distortion that may undermine their reliability and usefulness.

VI. DISTRIBUTION

Background and Purpose

Distribution refers to operations associated with the local delivery of gas, primarily to endusers. Distribution differs from transportation in a number of ways, although the distinctions are diminishing where each of these industry segments is becoming more competitive. Transportation generally refers to long-distance shipment of natural gas, primarily in interstate commerce. Distribution is conducted by local distribution companies (LDCs) within the borders of a given State, and it focuses on delivery of gas to customers at the burnertip. One of the key distinctions between distribution and transportation is that distribution falls under the jurisdiction of State authorities, while transportation falls under Federal jurisdiction when the relevant company is involved in interstate commerce, and State jurisdiction when the company operates wholly within the borders of a given State.[13]

Fundamental changes in the natural gas industry in many States are occurring with the advent of regulatory reform. The keynote change in State regulation, as it was at the Federal level, is the unbundling of the physical delivery system and shipping along the system from the other commercial operations such as buying and reselling gas. The local franchisee under unbundling provides delivery service, but the merchant function is conducted by other companies-frequently including subsidiaries of the LDC.

Regulatory reform at the State level can affect the system in ways that seriously impact the availability and quality of the data. For example, commercial arrangements in Georgia have changed dramatically with the introduction of customer choice in October 1999. The largest LDC in the state, Atlanta Gas Light, formerly had roughly 1.4 million sales customers who purchased and received the gas from the LDC. Presently, the gas commodity is sold to the 1.4 million customers by fewer than 20 certified natural gas marketers[14] instead of the one utility. The LDC continues to provide delivery service to the gas consumers served by the 20 marketers. The marketers pay for this service and they bill their customers for the full cost of delivered gas directly. In a somewhat different arrangement, the utilities in the District of Columbia continue with delivery of gas to consumers on behalf of the marketers who broker the sales, and they conduct meter reading and billing for the full costs of delivered gas. In Maryland, however, both arrangements are in use, so neither marketers nor utilities as a single group would have the pricing information. Each of these arrangements has important implications for the extent of data on-hand at the utility or elsewhere. The data collection process must account for these differences even though the working system may utilize combinations of collection methods in a single State.

Distribution data are important to complete the market balance picture on both a monthly and annual basis. As the final segment of the market supply process, the availability of the physical assets for local distribution and their performance are significant to issues concerning the security of local supplies. The costs affect customers directly, and they serve as useful barometers of relative efficiency between locales. This aspect of data analysis is expected to be a major source of interest for a number of years, as the benefits and costs of regulatory reform by State are assessed.

Data Items

Distribution data items are those pertaining to the local delivery service that are not covered elsewhere in the data system. These data can be classified as structural (miles of pipe and planned projects), supply (city-gate volumes and prices, whether local distribution is unbundled or not), and operational (number of customers and distribution charges). A number of other data items are not included here even though they relate to the local delivery information. For example, delivered volumes and prices for most endusers are important, but these items are accounted for in the *Next Generation * Natural Gas* data proposal in the consumption section. In fact, in States that have not unbundled, those data likely will continue to be collected from the LDCs.

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Price/Cost Issues

Distribution charges are an important element of prices paid by residential gas consumers.[15] They also serve as a significant barometer of industry performance. Distribution costs are affected by the tariff methodology and level of service. The price determination methodology has a particularly strong impact on the State level, given the wide variation in allowable procedures. At one extreme, Atlanta Gas Light Company has gone to a fixed monthly service fee for each customer (the marketers) that is generally established on a yearly basis. The monthly fee depends on the gas volume used at peak during the past year. Because the monthly fee is a fixed change, the average distribution cost per unit delivered is inversely related to the volume. However, distribution costs in other locations may include volumetric charges to varying degrees, since such provisions are established by policymakers of each State to meet their own objectives. The lack of uniformity in these charges affects the ability of summary data statistics to communicate market conditions reliably. Thus, it is incumbent on the analyst to understand these methodologies and their influences on costs.

Other Issues

Distribution under the traditional regulatory framework is the final phase in the supply chain of services. The traditional transition point from transportation to local distribution occurred with a transfer of ownership at the city gate. After the LDCs become open-access carriers of gas, the merchant selling to endusers often will purchase the gas at other locations than the city gate.

While the LDCs will measure volumes as received, unless the final seller of the gas can record the value at that transition point, a city-gate price will be unavailable. With these changes, the initiation point for local distribution arguably may become less clearly identified with the city gate, thus undermining the meaningfulness of the city-gate concept or comparability of city-gate measures between locations.

VII. MARKETS

Background and Purpose

The evolution of competitive gas markets led to the creation of new operational and commercial features in the system. An early development was the appearance of market centers (also called "hubs"), at which large amounts of gas are traded daily.[16] The market centers tended to develop at locations where a large number of pipelines already were interconnected and nearby storage facilities existed. The advantages of market centers include increased access to both short- and long-term supplies, access to storage, accurate and reliable price information, and access to numerous buyers and sellers of gas. The commercial advantages of market centers, especially at the Henry Hub, stimulated rapid growth in daily trade. The increasing price volatility that arose as gas was traded more like any other commodity led to the introduction of trading in natural gas futures in April 1990. Futures trading is referenced to a few selected locations, currently the Henry Hub and the market center at Waha, Texas.

Market data are important to complete the industry picture on both a monthly and annual basis. As a point where major volumes of gas are bought and sold daily, information on market center activities provides a key measure of current market performance. Those data in conjunction with data on futures trading serve as key indicators of the near-term outlook. Reports of these data on both a monthly and annual basis are highly valued by our customers. Further, a time-series of market center data often is needed for various analysis applications. These data provide a basis for analysis of market responses to changing economic conditions, which can assist policy formulation or investment decisionmaking. Further, the trading that occurs at these locations, and the use of spot and futures prices as reference points, highlights the importance of providing these data to EIA customers.

Data Items

Market data would include gas volumes flowing through the hub, prices and volumes associated with gas sales at the hub, hub throughput capacity, and capacity utilization. Futures trading data would be prices and volumes.

All activity data are expected to be collected on a daily basis, although publication is likely to be on a weekly basis for selected items, and monthly or annual for all activity data. Data on capacity are planned to be

collected on an annual basis. All data are expected to be available for individual market centers and on a regional basis. A detailed listing of these data items appears in Appendix A.

Price/Cost Issues

A preferred form of price is a volume-weighted average. The collection of associated volumes must be addressed diligently. At present, neither spot nor futures prices reported in the professional literature are not volume-weighted averages. Spot prices are the midpoints of a range of prices. Reported futures prices are the "settlement" prices, which are those prices associated with the final transactions of the day.

Other Issues

None at present.

Summary

The *Next Generation * Natural Gas* project is an ambitious, multi-year effort that is intended to produce a revised data system for the collection and processing of a comprehensive information system to describe the natural gas industry and markets. The data system needs to reflect the new realities that have been caused or inspired by regulatory reform. Achieving a successful new program will support EIA's goal to serve policymakers and private decisionmakers with high quality, timely energy information.

Footnotes

[1] Additional information on the focus groups and executive interviews are available from EIA.

[2] Details on the data requirements are available in the Information Requirements Table, located in Appendix A of this report.

[3] Volume units on a Btu basis could be measured in any standard multiples of Btu's (e.g., million or billion Btu), or equivalently therms or decatherms. One therm is 100,000 Btu, and a decatherm is 10 therms. Thus, 10 therms = 1 decatherm = 1 million Btu.

[4] A *landed* price is the cost of LNG delivered to the facility, which cannot enter the delivery system without being regasified. The price for some LNG imports is a *tailgate* price, which includes cost of regasification.

[5] It is expected that vehicle fuel use of natural gas eventually will be collected on a monthly basis. However, until consumption in this sector grows to be a more frequent, larger volume activity, there are serious concerns about the ability to produce reliable, quality data.

[6] There are approximately 140 interstate pipelines and 1,400 local distribution companies operating in the United States.

[7] For example, under regulatory reform, LDCs continue to deliver gas to customers on behalf of gas merchants. Unless the LDCs' rates or performance obligations are related to the customer classes, the LDCs have reduced commercial interest in measuring or recording volume information by customer class.

[8] The billing entity can be either a separate, third-party billing agent or one of the firms involved in any phase of the delivery process, such as the LDC that delivers the gas or the marketer that sells consumers the commodity.

[9] In particular, FERC Order 436 (1985) encouraged unbundling of sales and transportation, and Order 636 (1992) required pipelines to provide open-access transportation and storage, and to separate sales from transportation services completely. Source: *Energy Policy Act Study: Interim Report on Natural Gas Flows and Rates*, Energy Information Administration (October 1995).

[10] Some companies charge a "postage stamp" rate that is invariant with respect to distance. There were 30 pipeline companies with postage stamp rates compared to 22 with distance-based rates according to the Zinder Associates report, *Summary of Rate Schedules of Natural Gas Pipeline Companies* (March 1998). Larger pipeline companies tended to have distance-based rates.

[11] Volumetric provisions often are present to specify the entire volume that is scheduled for delivery within the period of performance, along with restrictions on the allowable daily variation within the period. For example, 100 million cubic feet to be delivered within the 30 days of November, with no more than 5 million cubic feet drawn down on any single day.

[12] The *city gate* is a point or measuring station at which a local distribution company receives gas from a natural gas pipeline

company or transmission system. Source: *Annual Energy Review 1997*, Energy Information Administration (July 1998).

[13] An exception to this distinction for transportation operations is a Hinshaw pipeline, which involves a limited aspect of interstate commerce, yet is outside Federal jurisdiction for regulatory purposes. A Hinshaw pipeline is a company engaged or legally authorized to engage in the transportation of natural gas in interstate commerce, but it is exempt from the jurisdiction of FERC by Section 1 of the Natural Gas Act if: 1) all the gas is received by the company from another company at or within the boundary of a State; 2) the gas so received is all consumed within the boundaries of the State; and 3) the rates, service, and facilities of the company are subject to regulation by a State Commission.

[14] As of December 22, 1999, 17 certified marketers were listed on the Georgia Public Service Commission's internet site, *www.psc.state.ga.us/gas/marketers.htm*.

[15] Measured as the difference between the average city-gate and residential prices, distribution charges in 1998 represented over 55 percent of the delivered cost to residential consumers. This figure is useful for illustrative purposes, but it likely overstates the share of residential costs attributable to distribution, because the average cost of gas delivered to the city gate for residential customers probably exceeds the average city-gate price over all sectors so the difference between the delivered residential price and the corresponding city-gate price would be less. Data from the *Natural Gas Monthly*, DOE/EIA-0130(99/08).

[16] The first market center in the United States is the Henry Hub in Louisiana, which began operations in 1988.

Comments or questions on *(NG)*^{2} should be directed to William Trapmann, Project Director, (202) 586-6408. You may also sign up for EIA's E-Mail Notification System to receive automatic e-mail service for selected information on the natural gas restructuring/residential choice programs and the *(NG)*^{2} project or other topics.

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Appendix A

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Information Requirements Table

Information Requirements Table for Next Generation * Natural Gas

Version: December 29, 1999	Frequency				Geography				Current Source			What's New	Issues and Comments
	Annual	Monthly	Weekly	Other	National	Market Area	State	Other	EIA	External to EIA	Uncertain source or feasibility		**This material represents a working draft for discussion purposes. Not to be considered final.**

Notes on Abbreviations:

FERC = Federal Energy Regulatory Commission
OFE = Office of Fossil Energy (DOE)
LNG = liquefied natural gas
LDC = local distribution company
Mcf = thousand cubic feet
MMBtu = million British thermal units (Btu)

DOMESTIC SUPPLIES

Dry marketed production													
Volume (Dry Gas)	X				X		X	X	X				Data currently collected from the States. "Other" areas coincide with EIA-23 publication, and include selected substates (e.g., Texas Railroad commission districts) and offshore regions.
Heat content	X				X		X	X	X			New item.	Needed for establishing consistent units of measurement; especially relevant to price data.
Volume (Dry Gas)		X			X		X		X				Data currently collected from States
Heat content		X			X		X		X			New item.	Needed for establishing consistent units of measurement; especially relevant to price data.
Price (first purchase)	X				X		X	X	X			Timely early estimates with minimal error.	Data currently collected from the States. Market area data not currently collected.
Price (first purchase)		X			X			?	X		X	Enhanced early estimates with reduced error and increased timeliness.	Currently collected at National level. "Other" locations may include selected States only.
Supplemental Gas Supply variables													
Synthetic natural gas	X				X		X				?		Volumes and prices
propane-air	X	X			X		X				?	Prices not previously available for volumes used as gas supplies	Volumes and prices
coke oven gas	X				X		X				?		Volumes and prices
refinery gas	X				X		X				?		Volumes and prices
biomass gas	X				X		X				?		Volumes and prices
manufactured gas	X				X		X				?		Volumes and prices

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	Annual	Monthly	Weekly	Other	National	Market Area	State	Other	EIA	External to EIA	Uncertain source or feasibility		**This material represents a working draft for discussion purposes. Not to be considered final.**
FOREIGN GAS TRADE													Movements across U.S. borders. "Other" areas are point of entry/exit or country of origin/destination
Imports													Imports are by country of origin. Additional detail includes identifying transactions data by short- and long-term authorizations, and by customer. Conforms to present procedure of OFE.
Pipeline gas variables													
Volume	X	X			X	X	X	X		X			Data currently collected by OFE.
Heat content	X	X			X	X	X	X		X			Needed for establishing consistent units of measurement; especially relevant to price data.
Price	X	X			X	X	X	X		X			Data currently collected by OFE. Border price
Border Capacity	X				X			X		X		New item, not previously available on regular basis	Data currently compiled from FERC sources and trade press
Peak flows	X			X	X	X	X	X				New item.	"Other" period is heating season.
Planned Projects	X				X			X		X		New item, not previously available on regular basis	Data currently compiled from FERC sources and trade press
Liquefied Natural Gas variables													LNG imports to Puerto Rico are expected to begin next year. These are imports to the US for our purposes.
Volume	X	X			X	X	X	X		X			Data currently collected by OFE. It is intended that the new collection system will continue to identify whether flows occurred under a short- or long-term authorization.
Heat content	X	X			X	X	X	X		X			Needed for establishing consistent units of measurement; especially relevant to price data.
Price	X	X			X	X	X	X		X			Data currently collected by OFE. Landed or tailgate price.
Regasification costs (if landed price)	X	X			X	X	X	X		X		New item.	
Terminal regasification capacity	X				X			X		X		New item, not previously available on regular basis	Data currently compiled from FERC sources and trade press
Planned Projects	X				X			X		X		New item, not previously available on regular basis	Data currently compiled from FERC sources and trade press
Compressed Natural Gas variables													
Volume	X				X		X	X		X			Data currently collected by OFE.
Heat content	X				X		X	X		X		New item.	Needed for establishing consistent units of measurement; especially relevant to price data.
Price	X				X		X	X		X			Data currently collected by OFE. Border price

Information Requirements Table for Next Generation * Natural Gas

Version: December 29, 1999	Frequency				Geography				Current Source			What's New	Issues and Comments
	Annual	Monthly	Weekly	Other	National	Market Area	State	Other	EIA	External to EIA	Uncertain source or feasibility		**This material represents a working draft for discussion purposes. Not to be considered final.**
Exports													Exports are by receiving country. Additional detail includes identifying transactions data by short- and long-term authorizations, and by customer. Conforms to present procedure of OFE.
Pipeline Gas													
Volume	X	X			X	X	X	X		X			Data currently collected by OFE.
Heat content	X	X			X	X	X	X		X			Needed for establishing consistent units of measurement; especially relevant to price data.
Price	X	X			X	X	X	X		X			Data currently collected by OFE. Border price
Peak flows	X			X	X	X	X	X				New item	"Other" period is heating season.
Border Capacity	X				X			X		X		New item, not previously available on regular basis	Data compiled from FERC sources and trade press
Planned Projects	X				X			X		X		New item, not previously available on regular basis	Data compiled from FERC sources and trade press
Liquefied Natural Gas													
Volume	X	X			X	X	X	X		X			Data currently collected by OFE.
Heat content	X	X			X	X	X	X		X			Needed for establishing consistent units of measurement; especially relevant to price data.
Price	X	X			X	X	X	X		X			Data currently collected by OFE. Landed price
Terminal liquefaction capacity -- Sendout	X				X			X		X		New item, not previously available on regular basis	Data currently compiled from FERC sources and trade press
Terminal liquefaction capacity -- regasification	X				X			X		X		New item, not previously available on regular basis	Data currently compiled from FERC sources and trade press
Terminal liquefaction capacity -- onsite storage	X				X			X		X		New item, not previously available on regular basis	Data currently compiled from FERC sources and trade press
Planned Projects	X				X			X		X		New item, not previously available on regular basis	Data currently compiled from FERC sources and trade press
Compressed Natural Gas variables													
Volume	X				X		X	X		X			Data currently collected by OFE.
Heat content	X				X		X	X		X			Needed for establishing consistent units of measurement; especially relevant to price data.
Price	X				X		X	X		X			Data currently collected by OFE. Border price

Information Requirements Table for Next Generation * Natural Gas

Version: December 29, 1999	Frequency				Geography				Current Source			What's New	Issues and Comments
	Annual	Monthly	Weekly	Other	National	Market Area	State	Other	EIA	External to EIA	Uncertain source or feasibility		**This material represents a working draft for discussion purposes. Not to be considered final.**
STORAGE													
Underground Storage													
Volume measures													Collected by field, which is identified.
Base Gas	X	X			X	X	X	X	X				Data for end of report period.
Working Gas	X	X			X	X	X	X	X				Data for end of report period. Volumes identified for owner/operator and third-party interests. Identify customers by major type (e.g., marketers, LDCs, etc.)
Injections into Storage	X	X			X	X	X	X	X				
Withdrawals from Storage	X	X			X	X	X	X	X				
Withdrawals from Storage			X		X			X		X		Weekly frequency	Weekly data provided by the American Gas Association (AGA) according to 3 regions in the Lower 48 States.
Peak Day Withdrawals	X	X			X	X	X	X	X				Report period -- November through March
Heat content	X	X	X		X	X	X	X	X				Needed for establishing consistent units of measurement; especially relevant to price data.
Revenue/Price Measures													This topic requires close coordination with operators to achieve quality data with good response rates.
Revenue from Storage	X	X			X	X	X				X	New item	Planned for calculation of average total cost per unit in and withdrawn from storage.
Revenue from Injections	X	X			X	X	X				X	New item	
Revenue from Withdrawals	X	X			X	X	X				X	New item	
Capacity Reservation Charges	X	X			X	X	X				X	New item	
Holders of capacity rights	X	X			X	X	X				X	New item	
Cost Items													
O&M	X							X			X	New item	Will coordinate with FERC collection activities.
Capital	X							X			X	New item	Will coordinate with FERC collection activities.
Taxes, other	X							X			X	New item	Will coordinate with FERC collection activities.

Information Requirements Table for Next Generation * Natural Gas

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	Annual	Monthly	Weekly	Other	National	Market Area	State	Other	EIA	External to EIA	Uncertain source or feasibility		This material represents a working draft for discussion purposes. Not to be considered final.
Physical Characteristics													Collected by field, which is identified.
Base gas capacity	X							X	X			Collection on regular schedule	
Working gas capacity	X							X	X			Collection on regular schedule	
Type of Facility	X							X	X			Collection on regular schedule	Salt cavern, depleted field, or aquifer
Start Year	X							X	X			Collection on regular schedule	
Operational Status	X							X	X			Collection on regular schedule	Options are: active, proposed, abandoned, and depleting.
Number of units	X							X	X			Collection on regular schedule	Reservoirs, caverns
Number of wells	X							X	X			Collection on regular schedule	Extraction, injection, observation wells, horizontally drilled & completed
Depth	X							X	X			Collection on regular schedule	
Location													
State & county								X	X			Collection on regular schedule	Multiple counties will be reported where facilities cross county lines.
Longitude/latitude	X							X	X			Collection on regular schedule	
Operator name & type	X							X	X			Collection on regular schedule	Types include: interstate (FERC jurisdictional), intrastate, independent, or LDC.
Owner name	X							X	X			Collection on regular schedule	
Capacity Delivery System													
Number of pipelines	X							X	X			Collection on regular schedule	
Capacity of pipelines	X							X	X			Collection on regular schedule	
Number and capacity of compressor units	X							X	X			Collection on regular schedule	The feasibility/difficulty of collection by type (centrifugal, reciprocal, both, and other) is planned for consideration.
Number and capacity of pipelines	X							X	X			Collection on regular schedule	
Number of Pipelines	X				X	X	X	X			X	New item, not previously available on regular basis	Identify individual pipelines with direct connections.
Size of Pipelines	X				X	X	X	X			X		Diameter (and other measures as appropriate)

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	Annual	Monthly	Weekly	Other	National	Market Area	State	Other	EIA	External to EIA	Uncertain source or feasibility		**This material represents a working draft for discussion purposes. Not to be considered final.**
Design Withdrawal Rate	X				X	X	X	X		X			
Field storage capacity	X				X	X	X	X	X				
Number of Active Fields	X				X	X	X	X	X			New item, not previously available on regular basis	
Planned Storage Projects	X				X	X	X	X		X		New item, not previously available on regular basis	
Customer profile													
Number and type of customer	X							X	X			Collection on regular schedule	Planned types: marketers, LDCs (gas), pipelines, electric utilities, commercial/industrial (firm), owner/operator, others, uncontracted capacity.
Gas volume delivered by customer type	X							X	X			Collection on regular schedule	
Gas capacity reserved by customer type	X							X	X			Collection on regular schedule	
Liquefied Natural Gas storage													
Volume measures													Collected by tank, which is identified by name.
Stock Gas	X	X						X	X			Collection on regular schedule	Data for end of report period. Volumes identified for owner/operator and third-party interests. Identify customers by major type (e.g., marketers, LDCs, etc.)
Injections into Storage	X	X						X	X			Collection on regular schedule	
Withdrawals from Storage	X	X						X	X			Collection on monthly schedule	
Withdrawals from Storage (Weekly)			X					X	X			Collection on weekly schedule	Weekly data for LNG storage has not been collected before on a regular basis
Peak Day Withdrawals	X	X						X	X			Collection on regular schedule	Report period -- November through March
Heat content	X	X						X	X			Collection on regular schedule	Needed for establishing consistent units of measurement; especially relevant to price data.

Information Requirements Table for Next Generation * Natural Gas

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Revenue/Price Measures													This topic requires close coordination with operators to achieve quality data with good response rates.
Revenue from Storage	X	X			X	X	X				X	New item	Planned for cal. of avg. total cost/ unit in and withdrawn from storage.
Revenue from Injections	X	X			X	X	X				X	New item	
Revenue from Withdrawals	X	X			X	X	X				X	New item	
Capacity Reservation Charges	X	X			X	X	X				X	New item	
Holders of capacity rights	X	X			X	X	X				X	New item	
Cost Items													
O&M	X							X			X	New item	Will coordinate with FERC collection activities.
Capital	X							X			X	New item	Will coordinate with FERC collection activities.
Taxes, other	X							X			X	New item	Will coordinate with FERC collection activities.
Physical Characteristics													Collected by field, which is identified.
Stock gas capacity	X							X	X			Collection on regular schedule	
Start Year	X							X	X			Collection on regular schedule	
Operational Status	X							X	X			Collection on regular schedule	Options are: active, proposed, and abandoned.
Number and capacity of storage tanks	X							X	X			Collection on regular schedule	
Depth	X							X	X			Collection on regular schedule	

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Location													
State & county								X	X			Collection on regular schedule	Multiple counties will be reported where facilities cross county lines.
Longitude/latitude	X							X	X			Collection on regular schedule	
Operator name & type	X							X	X			Collection on regular schedule	Types include: interstate (FERC jurisdictional), intrastate, independent, or LDC.
Owner name	X							X	X			Collection on regular schedule	
Capacity Delivery System													
Pipeline capacity of input system	X							X	X			Collection on regular schedule	
Capacity of pipeline sendout system	X							X	X			Collection on regular schedule	
Number and capacity of liquefaction units	X							X	X			Collection on regular schedule	
Number and capacity of regasification units	X							X	X			Collection on regular schedule	
Design Withdrawal Rate	X				X	X	X	X		X			
Number of Active Fields	X				X	X	X	X	X			New item, not previously available on regular basis	
Planned Storage Projects	X				X	X	X	X		X		New item, not previously available on regular basis	
Customer profile													
Number and type of customer	X							X	X			Collection on regular schedule	Planned types: marketers, LDCs (gas), pipelines, electric utilities, commercial/industrial (firm), owner/operator, others, uncontracted capacity.
Gas volume delivered by customer type	X							X	X			Collection on regular schedule	
Gas capacity reserved by customer type	X							X	X			Collection on regular schedule	

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Note: The consumption data requirements presented below use the sectors traditionally used at EIA. A goal of the project is to examine the validity of these sectors and propose alternatives, such as volumetric classifications, or SIC/NAICS categorizations													
NOTE: All consumption data is presumed to be available on heat content basis. If not, heat content must be included in each sector data.													
CONSUMPTION													
Residential													
Volume	X	X			X		X		X				Delivered volume for consumption
Price													
Total Delivered Price	X	X			X		X		X		X		Declining coverage expected with current collection system.
Price Components	X	X			X		X				X	New item	Price components include commodity, transportation, taxes.
Summer/Winter rates				X	X		X	X			X	New item	Needs further investigation to establish usefulness.
Price (indicator)			X		X			X			X	New item	Customer interest has been expressed in a timely indicator of price movement affecting this sector. Final specification will depend on further analysis.
Number of Customers	X				X		X		X				Measured as number of homes consuming natural gas.
# of marketers in each State	X				X		X				X	New item	Record both numbers in each market and market share of final sales. (Pertains to residential/commercial sales under currently evolving State level regulation.)
Commercial													
Volume	X	X			X		X		X				Delivered volume for consumption. Assess feasibility of volume split by use: feedstock, heating, other.
Price													
Total Delivered Price	X	X			X		X		X		X		Declining coverage expected with current collection system.
Price Components	X	X			X		X				X	New item	Price components include commodity, transportation, taxes.
Summer/Winter rates				X	X		X	X			X	New item	Needs further investigation to establish usefulness.
Number of Customers	X				X		X		X				Measured as number of commercial establishments consuming gas.

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Industrial													
Volume	X	X			X		X		X				Total delivered volume. Natural gas can be used in this sector for heating in the manufacturing process, as feedstock, and/or for HVAC. Investigating whether feasible to measure and report out these components separately.
Price													
Total Delivered Price	X	X			X		X		X		X		Declining coverage expected with current collection system.
Price Components	X	X			X		X				X	New item	Price components include commodity, transportation, taxes.
Summer/Winter rates				X	X		X	?			X	New item	Needs further investigation to establish usefulness.
Number of Customers	X				X		X		X				Measured as number of industrial companies purchasing gas for own use.
Fuel Switching - capacity	X				X		X				X	New item	Capacity with capability to burn multiple fuels.
Fuel Switching - gas consumption	X	X			X						X	New item	Gas volumes consumed in above equipment with multiple fuel burning capability.
Fuel Switching - replacement fuel	X	X			X						X	New item	Volumes of fuels (not gas) consumed in equipment with multiple fuel burning capability.
Cogeneration	X				X		X				X	New item	EIA needs to address the issue of gas used in manufacturing that also results in the production of electricity. Specifics of the requirement are being investigated.

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Electric Generation (Utility and Nonutility)												Availability of NUGS information would comprise new item.	EIA needs to address the issue of utility vs. nonutility generation (including cogeneration). The requirements in this area need to be coordinated with the Electric Power Division and OIAF to determine the "best" breakout.
Volume	X	X			X		X		X				Electricity volumes and prices are expected from CNEAF
Price													
Total Delivered Price	X	X			X		X		X				Price issues related to electric generation likely to be encountered by CNEAF are comparable to those affecting natural gas data.
Price Components	X	X			X		X		X			New item	Price components include commodity, transportation, taxes.
Fuel Switching capacity	X				X		X				X	New item	Capacity that can burn other fuels including natural gas.
Fuel Switching - gas consumption	X	X			X						X	New item	Gas volumes consumed in above equipment with multiple fuel burning capability.
Fuel Switching - replacement fuel	X	X			X						X	New item	Volumes of fuels (not gas) consumed in equipment with multiple fuel burning capability.
Number of Customers	X				X		X		X				Measured as number of electric power generating facilities purchasing gas for own use.
Vehicle Fuel													
Volume	X				X		X		X				Delivered volume for consumption.
Average Delivered Price	X				X		X		X				
General Consumption-Related Information													
Heating/cooling degree days	X	X		X	X	X	X	X		X			Currently received by EIA from National Oceanic and Atmospheric Administration (NOAA).
Frequency of customers switching suppliers	X				X	X	X	X			X	New item	May need to be focused on selected consumer sectors only.
Contract information	X				X		X	X			X	New item	May be feasible only on non-periodic basis for special studies.

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TRANSPORTATION													Much of the information expected to be available from external-to-EIA sources may be available at FERC. This aspect of the data process will be investigated.
Volume measures													
Delivered volumes	X	X			X	X	X	X				New item	Identified by transporter or recipient
State to State Movement													
Receipt at State Borders	X						X		X				
Deliveries at State Borders	X						X		X				
Pipeline Fuel Used	X				X		X		X				
Capacity Utilization	X	X			X		X			X		New item.	
Congestion index	X	X		X	X			X			X	New item.	Information on system bottlenecks. Requested in customer focus groups. It is unclear how to meet this requirement beyond utilization data.
Holders of capacity rights	X	X		X	X	X	X	X			X	New item.	"Other" frequency: seasonal. "Other" location: transportation corridors.
Peak Day Capacity Utilization	X	X			X		X			X		New item.	
Capacity Release Trading	X	X			X	X	X	X		X		New item, not previously available on recurring basis	"Other" location: transportation corridors.
Heat Content	X	X			X	X	X	X				New items	Needed for establishing consistent units of measurement; especially relevant to price data.
Price													Key issue related to prices is the basis: by company, by delivery State, selected corridors, market areas served, or other.
Transportation Price and Price Components	X	X						X			X	New item	Price components include reservation charges, usage fees, other charges such as balance fees and taxes. "Other" location: transportation corridors.
Capacity Release Price	X	X			X	X	X			X		New item, not previously available on recurring basis	Secondary markets are of growing importance in competitive markets.

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Cost Items													
O&M	X							X		X		New item	Will coordinate with FERC collection activities.
Capital	X							X		X		New item	Will coordinate with FERC collection activities.
Taxes, other	X							X		X		New item	Will coordinate with FERC collection activities.
Physical Characteristics													
Miles of pipe	X				X		X			X		New item	Will coordinate with FERC collection activities.
Design Capacity	X				X		X			X		New item	Will coordinate with FERC collection activities.
Compressor stations	X				X		X			X		New item	This information is important to understand throughput capacity. Will coordinate with FERC collection activities.
Markets Served	X					X				X		New item	Markets would be defined both geographically and by sector.
Expansion Projects	X				X		X			X		New item, not previously available on recurring basis	
DISTRIBUTION													May be combined with Transportation--conditional on specifics of regulatory reform at State level.
Miles of Pipe	X				X	X	X	X		X		New item	
Planned Projects	X				X		X			X		New item	
Number of Customers by Customer Class	X				X	X	X			X		New item	
City Gate Volume	X	X			X		X		X				
Heat Content	X	X			X		X		X			New Item	Need to establish consistent units of measurement; especially relevant to price data.
City Gate Price	X	X			X		X		X				
Distribution Charges	X				X		X		X			New item	Planned collection by EIA beginning 2000.
MARKETS													
Market Hubs/Centers													May limit to larger hubs, rather than comprehensive.
Volume Flowing through the Hub	X	X	X			X		X		X		New item, not previously available from EIA	
Volumes associated with gas sales at Hub	X	X	X			X		X		X		New item, not previously available from EIA	Volume expected in MMBtu.
Price associated with gas sales at Hub	X	X	X			X		X		X		New item, not previously available from EIA	Price expected in $/MMBtu. Prices should correspond to reported volumes if possible.
Throughput capacity	X					X		X		X		New item, not previously available from EIA	This item requires further investigation to assess ability of respondents to provide reliable and accurate info.
Capacity utilization	X					X		X		X		New item, not previously available from EIA	This item requires further investigation to assess ability of respondents to provide reliable and accurate info.
Futures Prices		X	X	X		X				X		Not previously available from EIA	Prices expected in MMBtu. Market areas: Henry Hub, KCBOT